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ous structure; many species contain inulin. It does not appear as if any decisive conclusion may be drawn from the internal structure alone in regard to the question of classification, and it must not be forgotten that the occurrence of bicollateral mestome strands in the Campanulaceae is not common to all members of the family. Of far greater importance seems to be the morphological structure of the flower, and quite especially of the corolla and the stamens. This same view was held by GRAY, and we find in his *Synoptical flora* that the Lobeliaceae are kept separate from the Campanulaceae.—THEO. HOLM.

Anatomy of *Palaeostachya*.—In an interesting article HICKLING⁸ gives an account of the cone of an important calamitean species. There are approximately eighteen sporangiophores and an equal number of sterile bracts. The former are axillary to the latter and are supplied by traces originating from the same node above the vascular strands, which pass off to the bracts. In spite of the fact that the sporangiophores are apparently in the axils of the bracts, the sporangiophore trace turns sharply upward in the secondary wood of the cone-axis through half an internode, to redescend afterward through the cortex to the sporangiophore. It appears from this investigation that the condition which is present in *Calamostachys*, in which the sporangiophore is placed high on the axis, is more primitive than that found in *Palaeostachya*, where it is apparently axillary; but nevertheless the sporangiophore in both these genera is an axillary structure and constitutes the ventral segment of its subtending, divided or undivided, bract. A very interesting statement on the part of the author, in view of the opinions recently expressed by CAMPBELL and SCOTT in regard to the presence of foliar gaps in the equisetel series, is the following: "It (the trace of the sterile bract) arises from the primary wood of that (the main) bundle, just where the carinal canal is obliterated and passes radially outward and slightly upward through the nodal secondary wood. . . . *No gap is left in the main bundle.*" The italics are the reviewer's.—E. C. JEFFREY.

Seed development in *Saxifraga*.—JUEL⁹ has published a rather lengthy account of seed development in *Saxifraga granulata*, including some reference to and a few figures of *Pyrola minor*. In *Saxifraga* the nucleus of the megaspore shows an apparently simple, homogeneous chromatin thread in synapsis stage, and the double chromosomes of later stages seem to arise, not from a splitting, but from a doubling of the thread. The number of chromosomes is about thirty. The arrangement of the conducting tissue and the course of the pollen tube are described. No plasma sheath can be demonstrated about the male nuclei in the pollen tube, but a thin sheath is evident after the nuclei are discharged. The male cells pass into a synergid, and probably the tube nucleus also. The definitive

⁸ HICKLING, GEORGE, The anatomy of *Palaeostachya vera*. *Annals of Botany* 21:369-386. pls. 32, 33. 1907.

⁹ JUEL, H. O., Studien über die Entwicklungsgeschichte von *Saxifraga granulata*. *Nova Acta Reg. Soc. Sci. Upsal.* IV. 1:1-41. pls. 1-4. figs. 6. 1907.